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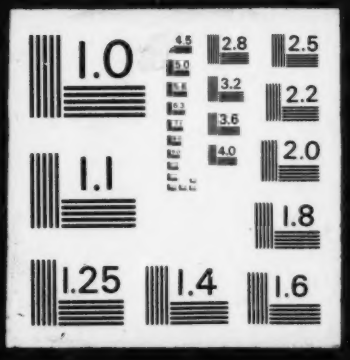

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CONFERENCE OF STATE SANITARY ENGINEERS (34TH) HELD AT ROBERT A. TAFT SANITARY ENGINEERING CENTER ON MAY 2-5, 1956

Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio

2 May 1956

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The proceedingsof the Morning Session, May 2, 1956, of the 34th Meeting of the Conference of State Sanitary Engineers are presented. Included are a list of the members present; the opening remarks of the Chairman; and a description of the organization, responsibilities, functions, and activities of the Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.

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34th Meeting

Conference of State Sanitary Engineers

May 2-5, 1956

at

Robert A. Taft Sanitary Engineering Center

TRANSCRIPT OF PROCEEDINGS

Morning Session

May 2, 1956

ACCURATE REPORTING COMPANY
CINCINNATI 2, OHIO

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Henry Steed, Georgia.

P R O C E E D I N G S

(Lynn M. Thatcher, Chairman, presiding; A. H. Fletcher, Secretary.)

CHAIRMAN THATCHER: Gentlemen, it is a pleasure to declare the 34th meeting of the Conference in session. We will proceed, in the interest of time, immediately to the first order of business, which is the roll call.

It occurs to me that we have had such a turnover in personnel of this Conference that we will have many new faces, and I would like to suggest, therefore, that in the roll call we follow the procedure of having the Secretary call out the name of the state and then have the member rise and give his name. In that way we can all get acquainted.

So, Al, if you will proceed, now, with the roll call.

(Roll call conducted by Secretary Fletcher.)

CHAIRMAN THATCHER: I want to take this opportunity, gentlemen, to welcome you all here. I won't be lengthy in these opening remarks because we want to hurry on and if possible make time later on this morning for some committee meetings, which also can be carried over into the afternoon.

I also want to express the sincere thanks of the Board to the Public Health Service, Mark Hollis and his staff, and Harry Hanson and his staff, and particularly Ralph Palange, who spent the day yesterday with Al Fletcher and myself in

getting this thing lined up. I am sure without their help this meeting couldn't be possible in these nice surroundings.

We are favored to have meeting with us this morning a number of people familiar to most of you, I am sure, from the Public Health Service, and since I am not sure that I can go right down the line and name them from memory I would like to ask Wes Gilbertson if he would be kind enough to introduce the people here along the side. Wes, could you handle that?

(Visitors from Public Health Service introduced.)

CHAIRMAN THATCHER: Thank you very much, Wes.

Gentlemen, let's give a vote of thanks to all these people for their help and support to this organization. I would be remiss if I didn't at the moment express my personal pleasure in being here. I have always felt it has been a great privilege to have the opportunity to come to these meetings and mix with you people, and exchange information, and get all the benefits that can come only from this type of gathering.

As I contemplate this turnover in membership that I mentioned a minute ago, and which our secretary brought out previously in his news letter, and as I glanced around and observed those of us who are a little balder than before, and recall those of us who have developed an ulcer or two, or possibly some other ailments, I am convinced that two years is

too long a stretch to wait for these meetings. I personally have no remedy for that situation, I am only convinced that it would be far better if we could meet oftener.

I think that as an organization here, the one overall impression that I have gained during the time that I have been in this position is that we still need to pursue the objective of greater effectiveness in functioning as a group. Many of our members individually have made great contributions in the field of sanitary engineering, provided leadership -- and that's all very fine, but I would still like to see the organization, as a unit, function more completely in this manner, collectively.

In that connection we have the question, of course, of cooperation with the State and Territorial Health Officers, a problem that we have discussed at length in our previous meetings. I would like to briefly report that a month or so ago I had a letter from Dr. Bergsma, who is President of the State and Territorial Health Officers Association, suggesting that the Chairman of their Environmental Sanitation Committee, who is Dr. VanHeuvelin, of South Dakota, could serve a very important liaison function between the two organizations by being invited to this meeting, and I took the liberty of inviting Dr. VanHeuvelin, I don't believe he has arrived. I don't have any word.

MR. CARL: He won't be here.

CHAIRMAN THATCHER: He won't be able to make it. I am sorry to hear that he won't, because I think that this is one of the important things. Nevertheless I was happy to have Dr. Bergsma's suggestion along that line, and I am sure that this matter of cooperation between the two organizations is something that the group here, and the Board, can give greater attention to.

Now, I would like to suggest that as we proceed with our discussions, for the benefit of the reporter each of you, as he rises to make a comment, identify himself by the State's name. That's a much more easily identifiable term and will be better than giving your name; so as we go into the discussions please remember to identify yourself by your state.

I would like to now take up the business of two committee appointments as tellers. I would like to appoint Earl Devendorf and Cy Everts. I have a package of ballots here which you two gentlemen can pick up when you have the time, and we would like to have you count the ballots and be prepared to report at the Friday morning session.

I would also like to appoint a Resolutions Committee: Mr. Reinke, of California, Chairman; Walter Shea; and Dwight Metzler. I think they are all here.

We have had one state come in since the roll call. Who was that?

(Additional appearances noted.)

CHAIRMAN THATCHER: I would like to also call attention to the fact that we are favored with the presence of one affiliate member, Mr. Menzies, of Canada. Will you stand, please?

(Applause.)

Mr. Boston.

MR. BOSTON: I would like to present an associate member of Georgia, Mr. Henry Steed.

(Applause.)

CHAIRMAN THATCHER: We will change the routine on the program here very briefly, because Harry and his group have been very kind to arrange a coffee break for us. It has to be on schedule. The cafeteria will set up arrangements just outside the registration room, as I understand it, and that will be at 10:30, so rather than launch into these formal presentations here now I will take up a little time for announcements.

The lunch will be in the cafeteria at 12:30. They have scheduled the times for lunch between three different groups, as I understand it, and so it is important that we wait until 12:30 to get into the cafeteria. It is possible that this session will be over early enough for some of you to organize committee meetings, if you will keep that time in

mind for the lunch session, and then we won't get into any difficulty there.

Now, I think you all have information on the banquet tickets. That information was available at the registration desk. The banquet will be held Thursday at the Hotel Sheraton-Gibson, the cocktail hour starting at 6:30 and dinner later. As you know from reading the program we have arranged to have Arthur Gorman speak to us at that time, and then we will have some tables for various types of committee meetings afterwards. I would like all of you to make arrangements to get your tickets early in the session so that they can give an accurate estimate on the number who will be present at that session.

Now, the tour of the Center that appears on your program is set up for this afternoon, and there is a possibility of a repeat on that tour Saturday morning for those of you who will be tied up in committee meetings this afternoon. I have been asked by Ralph Palange if we could get an estimate of the number who will be making the tour this afternoon, and then if we need another tour on Saturday, of the number who will make that tour. The time this afternoon will be approximately 1:30 to 3:50, and it will start in this room. Harry Hanson will tell you a little more about that later. Now, I wonder if you have your plans well enough organized that

at this time those of you who want to take the tour this afternoon could indicate by a show of hands how many will want to go this afternoon.

(Show of hands.)

SECRETARY FLETCHER: I counted 15.

CHAIRMAN THATCHER: Now, can any of you estimate at this time whether or not you will want to make a tour on Saturday? Apparently six. Ralph?

MR. HANSON: If there are any of you who have no time to do it either Saturday or this afternoon, we can make other arrangements for you if you speak to one of us, and we will be glad to see that you are taken around.

CHAIRMAN THATCHER: I have also been asked to announce that projection equipment is available in this room, there is a screen over there on the wall, and almost any kind of projection equipment is available if any of you happen to have slides that you would like to show in connection with your report, if you will let us know in advance so that final arrangements can be made on that.

Now I would like to ask Al Fletcher if he will proceed with the question of committee assignments-- assignment of committees to various meeting rooms. That will take care of you for any time left at this morning session and for any time you care to use this afternoon for your individual committee meetings.

(Rooms assigned to committees by Secretary Fletcher.)

SECRETARY FLETCHER: There will be stenographic assistance available so if you have a committee meeting and go over your report, or discuss the report, and then you need somebody to type something for you, or prepare mimeographed copies of your report, that service will be available. That typing service you can get through Mrs. Lindhorst, who is in charge of the registration up here in the conference room.

CHAIRMAN THATCHER: Thanks, Al.

Now, if any of the rest of you decide you want to be provided with meeting rooms there are still two available, and if we need more than that I understand that special arrangements can be made.

Now, in addition to the executive board meeting at 3:30 -- I don't think I have mentioned this to all the board members yet -- we would like to get together for a luncheon meeting in addition to the board meeting in room 315.

Now, are there any other announcements that should be made at this time?

If not, I am advised that the coffee is ready just outside the registration room. I would suggest that you limit this coffee break to 15 minutes so we can get on with our business and get the committees to work.

(Intermission, 10:15 until 10:30 a.m.)

CHAIRMAN THATCHER: Gentlemen, we will proceed with the program now, and I will ask Harry Hanson if he will discuss the responsibilities and activities of the Robert A. Taft Sanitary Engineering Center. Mr. Hanson.

RESPONSIBILITIES AND ACTIVITIES OF
ROBERT A. TAFT SANITARY ENGINEERING CENTER
(By Harry Hanson)

MR. HANSON: Mr. Chairman, and members of the Conference; we are genuinly proud to be your host this week, and are most happy that you have seen fit to hold your meeting here. We know that this means a sacrifice in many regards, because so many of you do have other kinds of business that you can transact at the nation's nerve center. We hope, however, that there are some compensations, and that least it will be a relief to hold your meeting in a city that has a first division ball club.

Any of those who are interested in the ball game tonight, presuming the weather permits, will probably not have trouble in getting good seats with general admission tickets, but if any of you would like better seats, reserved seats, we can make arrangements to get them for you, I am sure, if you will just let Ralph or Wally Towne or some of the boys know.

The Chairman has asked me to talk a little bit about the organization and functions of the Center. I would like to call your attention to a copy of an organization chart which I

believe each of you has.

Briefly, for all of the programs of the Division of Sanitary Engineering Services, the Center serves as the research, technical assistance and training arm. In order to facilitate the rendering of these services and the planning of our activities jointly with the several programs at headquarters most effectively, we have organized pretty much in parallel to the Headquarters Division. Thus we have a water supply and water polution program here; a milk and food; a training; an air pollution; and a radiological health; counterparts of the headquarters organization. The training activity extends across all of these programs. The only specific headquarters program that does not have an identifiable counterpart here is the general engineering program, of which the interstate carrier program is the predominant portion.

Since you will get a better idea of actually what is going on here on the tour, and we do hope as many of you as possible can make it, than I can give you in these few minutes, I will pretty much hit the highlights in these various programs and tell you something of our activities under way and some of our plans and dreams for getting into additional research, area by area.

In the water supply and water pollution control field we feel that the waste problems fall into two main categories:

where the need is one of devising more economical methods of treatment, devising means of treatment that are more suitable for the smaller communities, the suburban developments, and even the individual crossroads and household installations. Here we are interested in three main projects:

One, the waste stabilization ponds or lagoons, with which all of you are familiar. We have been making observations over the past year in the Dakota's, and to some extent elsewhere. We will have a couple of experimental lagoons with which we will be able to do about what we wish in Missouri and here in Ohio, and we hope to make arrangements for observations on others in a representative geographical set of locations across the country in the next year ot wo.

Our goal is to try to formulate the main factors that govern the operation of lagoons in such a way that they can serve as the basis for design under any set of meteorological, climatic and other conditions across the country. In other words we would like to formulate the light-energy requirements, the temperature, evaporation, percolation factors in a mathematical way so they can be applied to whatever particular local set of circumstances the design needs to be adjusted.

We are interested in the oxidation towers, and currently are cooperating with the State of Michigan, City of

Battle Creek, and the Dow Chemical Company in a pilot plant installation at Battle Creek. These oxidation towers simply seek to make use of high-surface, high-oxygen-availability types of structures with high porosity and high air movement. It is just an attempt to use some of the industrial materials that have been developed for counter-current flow processes and so on in the waste field, and we feel there is some real promise here for economies of sewage treatment.

We have been investigating an old principle in sewage treatment with a little different twist, the anaerobic reduction process. It essentially makes use of the old contact bed principle. We have a unit set up in the laboratory here which has been operating for some months. The results we have obtained with it are sufficiently promising so that we are now going to a pilot plant installation in one of the communities nearby here where we can test it on a larger scale and compare its efficiency with the efficiency of the standard sewage treatment process which the community has.

In essence, the influent flows up through an anaerobic sludge bed, overflows and flows upward again through a contact filter type of secondary treatment. The effluents that we have been getting show a high percentage of B.O.D. reduction comparable to full primary and secondary conventional treatment, and does not seem to have objectionable characteristics.

We feel that this type of installation would have good application particularly for smaller installations, because essentially pumping is about the only mechanical equipment involved, the head losses are very small, and a minimum of operation and maintenance would be required compared to the more elaborate installations.

INDUSTRIAL WASTES

Perhaps the most perplexing problem facing all of us in the waste treatment field is that of industrial wastes, and two things in industrial waste are pretty poorly defined. Better defined than the second one is the first, namely the heavy metal compounds. There are still some gaps in our information on heavy metals, and their susceptibility in sewers, and what concentrations, their effect on particularly anaerobic treatment processes, et cetera, their toxicities; and we hope to fill in some gaps in the heavy metal waste field, but as our main effort in industrial waste we are proposing to try a little more fundamental approach toward the industrial waste problem.

In essence, we propose to approach organic chemical waste by classes of chemical compounds that we might expect to behave similarly with respect to waste treatment and stream response. So out of the million or so organic compounds there is some finite number that are of significance in industrial

wastes, and out of that number we propose to set up, by class of compounds, those groups that are of particular interest and concern to us in water pollution and water supply. We would then characterize these classes of compounds in a variety of ways, seeking essentially to measure their pollutional effect in a quantitative way. We would want to characterize them in terms of their response to anaerobic treatment, their response to aerobic treatment, their physiological effects, their human and other toxicities and other physiological implications, their effect on aquatic life, their effect on water treatment processes, and their removability by water treatment processes. Those are six measurable pollutional effects that we believe can be undertaken. In addition, it would be important to have a method of analysis for each of these.

Now, this is not a simple approach. We are not naive in suggesting it and proposing to get into it ourselves; we realize that it is a rather bold and tremendous undertaking that will cost a lot of money and take some time. We feel, however, that it does offer more promise of being able to predict what the importance of a chemical compound, or group of chemical compounds is with respect to our answers in advance of post-stream studies, and so on. In other words, instead of going at it from the end mixture of waste and stream water and

trying to extract this whole enormous mess and then in turn break it down and analyze it, the "gunk" approach, we are proposing to take the other approach and deal with specific chemical compounds and groups of chemical compounds.

We believe that we may have a framework here into which universities, state agencies, interstate agencies and industries all may flow and contribute bits of information to the total picture, and at the end of five or ten years that we could have come a long way in characterizing our organic industrial waste.

We hope to have under field investigation in the waste field four things in this coming year: oxidation ponds, oxidation towers, possibly an algae conversion project on a little fuller scale than the California work, and a composting of industrial waste project.

Some of the kinds of compounds and classes of compounds that we are planning to undertake work on here ourselves are the nitriles; the vinyl compounds; the organic sulfur compounds; the insecticides, particularly chlorinated hydrocarbons; the aromatic hydrocarbons, benzene and its more simple derivatives; and the amines, primary, secondary and tertiary.

We would most welcome your comments, criticisms and suggestions with respect to this proposed approach to the

organic industrial waste problem.

WATER SUPPLY

In the field of water supply our research has been quite limited, particularly in the engineering aspects of water supply. Actually about all that we are doing now in the engineering end of water supply work, financed out of our own appropriations, is the evaluation of water treatment practices in relation to removal of coliform organisms that Graham Walton has been pursuing the last several months. This essentially is an effort to see what kinds of coliform loadings our water treatment plants over the country are handling, what filter rates are being used successfully or unsuccessfully, and is an effort to get at whether our present generally-used standards are reasonable or whether they could be modified quite substantially. I think one of the things that is coming out of our observations to date is that the filter has very little work left to do in many cases, and with carefully controlled coagulation and chlorination we feel that there may be a distinct possibility of even getting along without filters in some cases, or going to something in the nature of a polishing filter that would be much less costly than the standard filters in use.

We are interested in trying out some of the new industrial coagulates. Some of these are almost miraculous

in their coagulating properties, but their use in industry has not had to take into account their toxicity and other things that we would think of as of prime concern if used in public water supplies.

There are four field investigations that we either are engaged in or hope to get into in the next year or two. The first of these is the reservoir evaporation control work in the southwest. The Southwest Research Institute at San Antonio has had Dr. Mansfield, from Australia, who has been pioneering in this work, over on a seminar on the subject of reservoir evaporation control. We have been invited into the research program to do certain parts of it, and the Bureau of Reclamation, the City of Oklahoma City, and the State of Oklahoma have also invited us to participate with them in some similar studies in the Oklahoma City area.

The conservation of water by controlling evaporation is of exceeding importance in the more arid sections, and the potential reductions are well up over 50 percent.

We also feel that the whole subject of underground storage and recharging has not received attention appropriate to its potential. We consider that the underground storage possibilities probably far exceed the surface storage possibilities, and do provide a means for capturing, for subsequent use, waters that otherwise are wasted to the sea,

and that the quality is preserved when it is stored underground, and that a great deal of water supply insurance could thus be provided. We feel that there is room for the development of techniques in this whole field.

The Southern California Flood Control District has probably done more work on this than any other outfit in the country. Their interest, though, has been directed quite a bit towards prevention of salt water intrusion, which is another one of the things that we are interested in pursuing. But we see no reason why underground storage and recharge should not be a part of comprehensive water resources development programs, right along with the surface storage aspects.

The re-use of used waters, if not for primary municipal purposes, at least for secondary municipal purposes and certain industrial purposes, seems not too far in the offing when we look at the projected water demand trends, and here ion exchange materials and perm-selective membrane developments offer some hope of taking waters that are slightly on the unacceptable side and making them acceptable, and re-using irrigation waters and sewage-contaminated waters that have accumulated an unacceptable amount of dissolved solids.

So much for water supply and water pollution.

MILK AND FOOD

In the milk and food field we have in our research

program here probably the most undernourished part of our activity; certainly in relation to the national problem, and in relation to the percent of sanitation funds that are spent on it in the health departments across the country.

We have a food chemistry unit in our milk and food research program. They are concerning themselves presently with paralytic shellfish poison, and have made arrangements now for a reference standard for bioassay. They have worked out the bioassay procedures for use by those shellfish-interested states where paralytic shellfish poison presents a problem.

They are also working on chemical assay procedures, since bioassay is always a little more cumbersome and difficult and not quite as precise as chemical. They are also working with M.I.T. on the high energy radiation destruction of paralytic shellfish poison. It is a rather delicate chemical compound and it is possible it may be cracked by high energy radiation.

In food microbiology they have been working with Civil Defense and otherwise on the quantitative recovery of microorganisms from surfaces, and in development of a rapid presumptive method for detection of staphylococci in food; have been working on milk programs and have been doing some work on minimum flow times for high-temperature, short-time pasteurization up in the temperature range of 160 to 200 degrees

Fahrenheit.

Amongst other things that we feel need attention in the milk and food field, but on which we are not able to focus any resources at present, are:

The detection and control of specific microbial or toxic contaminants in foods. Again, some work has been done, without much promise, on a chemical determination of staphylococci. The value of such in food control I am sure is obvious to all of you.

Development and analysis of indicator methods for food sanitation.

Influence of aquatic environment and commercial practices on sanitary quality of shellfish. The shellfish investigations dealing with the effect of aquatic environment on the quality of shellfish, which were done at Woods Hole, now being done at Pensacola, should be carried next to the West Coast, with the species and water conditions and pollutional conditions of that area.

The relation of preparation and holding temperatures to sanitary quality of perishable foods; the effect of inadvertant warming and cooling on the sanitary quality of precooked frozen foods. I am sure that all of us recognize that these frozen foods go through a lot of devious kinds of handling and storage on platforms and in unrefrigerated places, and it would be nice

if there were some way that the consumer could know whether the precooked frozen food that he was purchasing had been thawed out and then frozen again, and might therefore not have the quality that it originally had.

And then we expect to be concerned with the microbiological and chemical changes associated with commercial processing of poultry.

And, lastly, some studies on the irradiation of foods.

COMMUNITY AIR POLLUTION

The community air pollution program is our newest baby here. It is divided within the Public Health Service into two parts; the medical and health aspects of it are the responsibility of the Division of Special Health Services, under the direction of Dr. Will Fisher; and the engineering and physical science aspects are the responsibility of the Division of Sanitary Engineering Services, and most of this work is being done here, and out of here, under Arthur Stern's direction. What we think of as the Washington responsibilities are under Frank Tetslaff's direction at headquarters; and I might say that the general division of responsibility between headquarters and here run something like this: Headquarters' programs in the Division being responsible for overall policy, overall program guide development, legislation, inter-agency negotiations that have to be conducted at Washington or can best

be conducted there; matters intra-service and intra-department; and in general the trend has been toward the Washington end of our Division handling more the staff-type activities, with the operational-type activities being increasingly in focus here.

You might be interested in the budget for the current year for air pollution. It totals $1,784,000. We can get these figures to you, so you don't have to copy them down.

For direct operations (non-medical) -- that mainly is what finances the Washington staff, our activities here, and any of our field activities -- $434,000.

Direct operations on the medical side, $160,000, most of which is spent in the occupational field, occupational health field, headquarters here in Cincinnati.

Research grants, $500,000.

Research contracts (non-medical), $50,000, (medical), $200,000.

Training at SEC, $40,000.

Research by other Federal agencies, on reimbursements from these funds: Weather Bureau, $200,000; Bureau of Mines, $100,000; Bureau of Standards, $100,000.

We, of course, don't know what the outlook will be for '57, but we are anticipating that the appropriation will go a little farther toward the $5,000,000 authorization that is provided in the bill.

Now, air pollution work is divided into four or five major segments. The first of these is Chemical Research and Development. One of the principal activities of that group, of course, is the National Air Sampling Network, now in its second year. This involves the collection of air samples from all parts of the United States on a routine basis for shipment to the Center for chemical analysis, and this effort is giving us a unified picture of general pollution over our metropolitan areas in the nation, and the counterpart control areas, and we hope will prove to be a useful tool when correlated with the epidemiology of air pollution under study by the medical side of the program. This is the part of the program that is interested, of course, in the kinetics reactions, and the basic work underlying the causes for formation of smogs and so on.

Engineering Research and Development has as its general area of activity the determination of the nature and quantity of effluents discharged to the atmosphere, and the development of means for the reduction of the quantity or change in the nature and quantity of such effluents. We have in operation here now a pilot plant and testing facilities, and the specific projects being undertaken this year are an experimental study of the factors influencing the design and performance of fabric filters of the cloth type, such as bag

houses, dust arresters, and cloth dust collectors. We are proceeding with the installation of an experimental incinerator and will have that under way during the year. This complements the work that the Bureau of Mines is doing on incineration; we are not duplicating each other.

We have some field studies planned, those concerned with the cotton ginning industry, and we have a couple of people assigned to Los Angeles County, one assigned to the State of California.

And that is about our engineering research and development program at present.

Instrument and Methods Development is a small group concerned with the development of automatic recording and other instruments for the measurement of air pollution. One of the things that we have been pursuing is the so-called Pacific Air Mass study, the effect of the outside atmosphere and its contaminants on the complex in the city, and determining whether or not such things as ozone and nitrogen oxide carried in in the exotic air mass are actually playing an important role in the smog that develops when the metropolitan atmosphere and the exotic atmosphere mix.

All of our meteorological services are provided by the Weather Bureau, on a reimbursable basis. Rather than attempt to recruit our own meteorological staff we simply asked

the Weather Bureau if they would provide that staff, and they have provided it in residents here. We thus get the advantage of the backup of the whole Weather Bureau, and find it a most satisfactory and interesting experiment in intergovernmental relations. They will be working on such things as the definition and prediction of smog episodes; the relationships between meteorological variables and air pollution levels; trajectories and air mass modifications; feasibility study of modeling atmospheric transport and diffusion; and the development of both a mobile and a fixed meteorological station.

The State and Community Services is the one that comes closest to you folks. This, again, is a small group and is designed to provide the kinds of services that are implied in the name. The largest project within that group is the Louisville Project. That is a cooperative project between the State, the City, the County, and Industry in the Louisville area, with all contributing a portion of the resources. In addition the Bureau of Mines, the Weather Bureau and the Bureau of Standards have taken some of their resources to put in on specialized aspects of this study. The purpose of this study is to augment existing knowledge of the nature, extent and sources of the problem, and to provide a basis for a rational program of control.

We have two men working in Connecticut assisting the State in making a statewide survey of their air pollution problem.

We have requests for assistance in a number of other states on statewide evaluation of their problems, and assistance in connection with specific problems of a state or area.

Training is the last activity under Air Pollution. We have had two seminars, one on problems connected with the organization and administration of state air pollution programs, the other on problems of local air pollution agencies. We have had one primarily for the chemistry of air pollution, another on stack sampling procedures; and a fifth training course is coming up in air pollution meteorology, in May of this month.

RADIOLOGICAL INVESTIGATIONS

Our radiological health investigations are conducted here and at Oak Ridge. Our main effort is going on at Oak Ridge, working cooperatively with A.E.C. and the Oak Ridge National Laboratory on disposal of radioactive waste.

Here at the Center we have been interested in the measurement of radioactivity in water and the fate of radioactivity in the environment; have been checking quite a bit of information on fallout, rainout, snowout, doing work on

ponds to see what the fate of these materials that are deposited naturally from the air is; and we have been working on the development of assay procedures, particularly for water, and have been working with Orsanko on development of a plan for making radiation measurements, base-line radiation measurements throughout the Ohio River Valley. We hope, in doing this, that we might be able to develop a pattern of sampling locations, types of samples, frequency of sampling and so on that could serve as, or could be used in other parts of the country to get a base-line assessment of radiation levels in the water resources.

We just recently released to the states and to the cities in those states that have been participating in the Network, the radiological data that has been accumulated from the air samples, so each city that has been in the network will have the fallout data, the levels of radiation picked up in the high-volume air samples over the last year or two; and those that are now in this radiation network that currently is getting under way will probably be making some comparisons between the levels they are measuring this summer and the levels that were observed over the past couple of years, and you may get some inquiries in regard to comparisons between those levels.

TRAINING PROGRAM

I think all of you are familiar with our training program here at the Center, so that I do not need to more than touch on it.

We have been able to bring many more courses to the field in the past year, and we hope to continue to bring as many to the field as we possibly can, particularly, though, in pioneering new fields like air pollution, and new courses even in the existing fields. It is quite difficult to carry these to the field. I am sure that you recognize that the facilities, equipment, staff and so on, that are available here, make it much easier to hold some of these courses, particularly during the developmental period, here. We are not unaware at all of your difficulties in negotiating for funds, particularly for out-of-state travel.

We are hoping to move, in the radiological training field, a little bit away from the basic nuclear physics type of training that we have been doing for the last few years, feeling that the universities are now picking this up in their physics and related courses, and we hope to move into more of the applied type of course, courses dealing with problems created by the installation of reactors, for example, in a community, and so on.

One interesting development will be taking place in June. The Department of Defense has asked us if we would

hold the first set of summer training courses for the commissioned reservists of the Army, Navy and Air Force; so in June we will have a two-weeks' course the first half of June and a two-weeks' course the last half of June for the commissioned reservists in sanitary engineering of the Army, Navy and Air Force, and of the Public Health Service.

This is a venture that we hope might bring sanitary engineers in civil life even closer to those in the military service.

Our new training bulletin will be out by July 1, giving the complete set of courses scheduled for the ensuing year. You probably recognize the agenda for our various training courses (exhibited). We picked a color now for each field, like water supply, air pollution, and so on; and we will be distributing these also to the mailing list that we have.

Just one final word about a subject that has certainly concerned me, and in discussing it with a number of the professors in schools of sanitary engineering, and some of the state engineers, I feel it is of increasing concern to them, too, and that is this question of ourselves, the Vanishing Americans. If we look at the trend in graduates from sanitary engineering teaching centers of the country we are rather alarmed to find the rapid rate at which these graduates are declining; and while our problems are going up steeply

our people that are being provided out of our teaching centers to cope with them is going down sharply. For example, last year, the 1954-55 school year, we graduated around 100 masters and doctorates in sanitary engineering, and out of those less than 50 percent were new talent to the field. At least 50 percent were simply taking training and going back to jobs that they had. The number of undergraduate students is less than the number of graduate students by quite a bit, and if we look at the pattern at the various schools year by year, in terms of both graduate and undergraduate production, we see zero, two, one, three, four, zero, two; and essentially we have an awful lot of one-cow dairies in these teaching centers, and I frankly don't know how they can continue to exist and turn out quality people.

If we assume that the 5,000 sanitary engineers that we now have will each have a life service of about 30 years, we have going out each year at the retirement end about 160 engineers, and we are producing less than 100, and the trend has been steadily and sharply downward the past five years.

I simply wanted to mention this to you because I know that you are faced with the same kind of difficulty in getting qualified people to attack the new problems that are your responsibility, that you are having the same kind of difficulty that we are having, and that the universities themselves are in

dire straits.

Thank you.

(Applause.)

CHAIRMAN THATCHER: Thank you, Harry, for that excellent description.

I think most of you, that is those who intend to go on the tour this afternoon, will have an opportunity to ask some detailed questions about these activities, and since we are going to have to hurry along we will dispense with questioning right now.

Clarence Sterling has been giving some attention during the past little while to air pollution, and has consented this morning to bring the conference up to date on the things that he has found in that field. We'll turn the time now over to Clarence.

AIR POLLUTION CONTROL
By Clarence Sterling

MR. STERLING: I must say that this is going to be a very informal presentation. In fact, I had very little of it written down. Harry just took 60 percent of that away from me. But that doesn't make me sit down, however.

I am calling on assistance from Cy Everts, from Oregon, to help out in this thing, as well as Art Stern, who is in charge of the air pollution program here at the Research Center.

Now, as a State Sanitary Engineer I have been very interested in the development of the air pollution control problem. Many of the cities, as you know, in the country, have been carrying on anti-smoke, or anti-dust programs, and in our state, for example, Massachusetts, the first one we have on record is in about 1900 in the City of Springfield, and I don't think that program has advanced one step since it was started some 56 years ago.

In the City of Boston we have had a joint program for observing smoke, the so-called smoke inspection district which embraces about 330 square miles and some two million people, which was started primarily because of the smoke difficulties from locomotives and power plants. Curiously enough, that service is paid for by the cities that it serves, which is a nice way to have it done. You can name other cities that have had smoke programs probably longer than that. But the problem in the field has been mostly smoke and dust.

Now, we have had more spectacular things happen in the air pollution field that aroused our interest, like the Donora incident, other incidents in Europe, the smog problem in California, which has some of the best advertising on television and radio programs. I don't think any program has given Hollywood without talking about a joke on smog. And some of these more spectacular things, of course have aroused the

interest of the country and have made a big imprint.

But primarily it has aroused the interest of the U. S. Congress, and placed the problem in the hands of the various interested Federal agencies, and also caused the states to sort of get on their horse to get on this particular problem and have some type of a program.

Now, Public Law 159, which was the Air Pollution Act passed by Congress, authorized certain things, and while many of you are probably familiar with the law I will run over, just very briefly, a couple of the points in the law and the philosophy in back of it.

This Air Pollution Control Act authorizes the Surgeon General of the Public Health Service, under the supervision and direction of the Secretary of H.E.W., to conduct a program of research and technical assistance relative to air pollution control; and it authorized a maximum appropriation of $5,000,000 annually for each of the five fiscal years from '56 through '60.

Of course, like many of the programs that are authorized by Congress, appropriations never reach the authorized figure, and I think you heard Harry just say that $1,785,000 was appropriated during the past year.

The Act states very clearly that the policy of Congress is to preserve and protect the primary responsibilities

and rights of states and local governments in controlling air pollution; to support and aid technical research; to devise and develop methods for abating such pollution; and to provide Federal technical service and financial aid to states and local government air pollution agencies, and other public and private agencies and their instutions, in the formulation and execution of their air pollution abatement research program.

The Surgeon General is authorized to cooperate with Federal, State and local agencies to carry out joint studies; he is authorized to conduct, collect and disseminate information; he is authorized to conduct research on public health service and support, aid the conduct of research by states or local air pollution control agencies, and to publish the result and to conduct investigations and make surveys concerning the specific problem when requested by any state or local air pollution agency, and to publish the findings, and to make grants or let contracts for research, training, and demonstrating projects to state and local government air pollution control agencies and individuals.

Now, Harry just pointed out how some of the funds that have been appropriated have been allocated by the Public Health Service, and a real forward step has been made.

Harry has also explained what the division of authority was, as far as the Public Health Service is concerned,

between the Washington office and Cincinnati, and I am, of course, very glad he gave that evaluation and differentiation.

Now, from a state viewpoint we were one of the states -- there were two, or possibly three states, I believe Oregon and Massachusetts -- which went ahead originally to try to get an overall state pollution control act, and we were successful in getting such an act, and it does give the responsibility to the Division of Sanitary Engineering in the State Health Department.

Now, each state is a separate entity unto itself. It is very difficult to get a general pattern of how it should be done in any state. Since our act has been passed other states have adopted air pollution control provisions, legislation, with different mechanisms; by setting up a special board, by incorporating boards in the State Health Department itself; by giving it directly to the State Health Department; or in some cases they are even considering keeping it completely outside of the State Health Department.

But at least there is interest, and there are patterns being adopted that are of interest to the others who havenot adopted it.

Now, briefly, in our act we are permitted to do certain things. Any city or town or groups of cities or towns can set up an air pollution control organization; or in the

event they do not set up an organization the municipal or community health department can assume the function.

In other words, that permits the local communities to handle their own problems in their own areas if they have a real problem. They may adopt rules and regulations, which must, however, be approved by the State Health Department in order that we shall have some similarity in the rules themselves.

In addition the State Health Department, in the Division of Sanitary Engineering, can adopt rules and regulations if we see fit. We haven't done that at the present time.

We found, however, that in our program the one thing that was necessary was to get some money. Instrumentation is important. The same as the Public Health Service is doing here, collecting and analyzing many samples collected in their program throughout the country, we have been doing the same thing in our state. We analyze them for many things, and still don't know the value of a lot of the analyses, but we are hoping that as we learn more through our research grants that we will be able to get a proper evaluation of he analytical data. But I must confess that much of the data is still Greek to those, or the administrator who is administering a program of that kind, of that type.

Now, in our present status we find that the general public are interested in two things primarily, that is still

smoke nuisances and dust nuisances. They have a third category, which is odor control, and which has been an old problem with certain types of industries for many years, what we call in our state the noisome trade.

But primarily people are interested in what they can see at the present time.

Now, we have been asked by several communities to make surveys of their problems in their communities. I went to the legislature to obtain some money for a staff, and we were successful in getting additional funds for equipment and for staff. In setting it up in the Division of Sanitary Engineering we made it a section similar to our Stream Pollution Control Section, however we included radiological health, as a similar law was passed at the same time in regard to radiological health, placing that responsibility in Sanitary Engineering.

So we organized this section and have staffed it now with about six persons who have been trained in both of these fields.

We felt, however, that with the number of requests we have had for surveys, that we couldn't possibly handle it all ourselves, or in some cases extensive surveys were not indicated at this time, so the legislature, in giving the money, also tacked on a little provision in our appropriation bill that communities wanting surveys would bear a part of the

cost of the survey. They left it up to the discretion of the Department, however, as to what that amount would be, and to date it has been a token amount which has supplemented our regular appropriations for air pollution control.

The first thing that we find that somebody wants to do, of course, is to adopt some kind of regulation, and I find out, by talking to the people in air pollution control, that possibly the formation of regulations is one of the most difficult things to do, particularly if you want to get them to hold up in court. And we have tried to discourage communities from rushing into regulations. We have, however, had to satisfy some of the needs where there was a real problem, and we have suggested rules and regulations, and I have a copy of it here if anybody is interested in it, which is very simple for a community to adopt and be able to train their personnel locally to carry out and enforce the regulations. They pertain particularly to dust, smoke, and possibly sulfur compounds, and the amount of organic matter in fuels -- that is volatile matter, rather, in fuels, solid fuels that are used. They are stated in very simple terms and are such that we can train local inspectors to carry them out with a reasonable amount of assurance that they will not be too hard on industry and at the same time satisfy the public demand for abatement of the nuisance.

Now, whenever we make a survey in a community one of the things that bothers us to start with is whether we are interefering with the consultants in the field. In other words there are consulting engineers practing consultation work in air pollution control, and as a result we are afraid that we might, when making the surveys, we might get into their business, or potential business as this field grew. So I took up the question with a number of consultants who were practicing in this field, and all of them that I consulted felt that the work that would be done by a control agency would be advantageous to them. As a matter of fact, for example here was a comment of one consultant you may know, Professor Silverman of Harvard, Les Silverman, who probably does as much consulting work as anybody in the state: He said, "Well, if I had to depend upon my fees for consultation I would starve to death in this particular field if I didn't have my bread and butter money at Harvard School of Public Health." And as you analyze it you can see that that is the case, because most of our consultants in other fields, like waste treatment and water supply, water treatment, don't usually make their per diem on consultation, but they get their real money from the construction of plants and their percentage on installation; and when you look at the air pollution field very often a lot of the materials are bought as a package deal, it is mechanical

equipment which they buy as a deal, so there really isn't a big field for the consultant. But the ones I consulted felt if we made the study we would get more people interested in doing something about the problem, and might increase their business instead of holding it back.

Now, I just tell you that as one of the problems that we thought of at the time we went into this program.

Today we are trying to make surveys -- I might summarize -- we are trying to make surveys in localities where there is a need for such surveys; we are training the personnel in the community to work along with the survey so that they will be ready to carry out the rules and regulations if they are adopted when they are completed; and we are also holding seminars, primarily for industry, in the communities themselves.

In other words, when we make an air pollution survey we invite industry to send their top personnel to a series of conferences on air pollution studies, and in that way we find we do not get the opposition of the industrialists, they have a better idea of what we are trying to do, and primarily they get more respect for the competence of the staff that are on the job. It isn't the thing like, "Well, he's a state man and he probably doesn't know anything about the problems in industry", but by these meetings through conferences we find that we are not getting the opposition we anticipated.

Actually each place, each state will be an individual problem. I think it is a very real problem. And the work that is being done here by the Public Health Service, and the research, will be invaluable in the future. We will probably, undoubtedly get more information as to the effect upon health; but if you are looking for just the effect upon health today to carry on air pollution programs, there wouldn't be too much tangible data you can base your conclusions on.

Now, I have just very briefly outlined what we are doing. I would like to ask Cy to supplement by what he's doing in Oregon. I think you will find he has a different approach to the problem. After all, he's in the other end of the country.

MR. EVERTS: In order to set the record straight right at the very outset, I might say that in spite of the fact that we are some 3,000 miles away, I thought Mr. Sterling was giving a very good outline of the Oregon program.

Our program became effective in 1951, following the adoption of an act by the legislature which established an air pollution authority in Oregon, which was a division of the State Board of Health, and which gave that Authority powers and duties which were supplemental to those granted to the State Board of Health under the general health laws.

The Authority consists of five members, the State Health Officer as ex-officio member, four members appointed by the Governor, one of whom shall be a member of the Water Pollution Control Agency of the State Sanitary Authority, and that was included in the law for liaison purposes.

While the act in Oregon became effective in August of 1951 we were unable to secure a technical staff to start work until June of the following year, which means that as of this summer we will have been in operation in the field of air pollution control for a period of about four years.

I might point out that when Oregon initiated its air pollution control activities that we had to learn the hard way, because there had not been too many precedents set for a statewide program, which is the type of activity embodied in the Oregon act. We do believe that over this four-year period that we have accumulated a whale of a lot of information and data, we have been able to improve sampling techniques and sampling equipment, and that the program as a whole has certainly gained in maturity.

Initially we started with the use of particle-fallout stations, for the reason that the majority of complaints which had been received were those dealing with nuisance conditions involving fallout from soot, cinders, fly ash, dust of one sort

or another, from manufacturing plants, chiefly lumber manufacturers.

Being ambitious, we established about 155 of these sampling stations throughout the state, in about 40 communities. It wasn't long before we found out that we had more samples in the laboratory for analysis than we had chemists to analyze them; and, in addition, we weren't able to get some of the information that we needed. Undoubtedly the data that we did get from those samples -- and there were some 1200 of them before we were through -- enabled us to do some pretty good planning for our future work, and those stations have now been reduced to about 23 in 18 communities, which gives us a pretty good surveilance network throughout the state on fallout.

Initially the quipment we used, such as the fallout station equipment, might have sounded rather simple, but when you have 155 stations scattered around the state, on the roofs of fire stations and school buildings, and other public establishments, in weather temperatures varying from, say, 110 in the summer to below freezing in the wintertime, a number of problems immediately appear which certainly must be thought of. One is the evaporation of the water in its particle-fallout container, or sampling containers, in the summertime; another is the freezing of the water in the wintertime; and a third one which we had not anticipated. I don't know whether you know it

or not, but in some places in Oregon we have got a lot of rain, and we get enough in some seasons to not only fill up these gallon jars, but overflow them, so we had to have some device there to take care of the additional water that was put in them by the elements.

Over the period of years that we have been in operation we have had some 210 complaints made. All of those have been investigated. In most instances corrections have been obtained, and you might be interested to know that in this period of time more than $2,000,000, which doesn't sound like a lot of money, but which involves a lot of corrective equipment, has been installed.

Initially one of the objectives of the Authority's program was to obtain sufficient data on which to base standards, and we feel that in certain areas that we have enough data now to establish standards on particulate matter in the air, and on smoke.

A set of proposed standards and regulations governing control of air pollution, and a set of proposed regulations governing administrative procedures have been prepared and have been submitted to various groups -- industrial establishments, municipalities, and others, for comment. If any of you are interested in taking a look at those, why we would be glad to send you a copy if you will

write for it. To give you some idea as to the interest that developed in these standards, we produced about 200 copies for distribution, and at the first meeting of the Air Pollution Authority when these standards were to be considered, we had requests for 1,000 additional copies, and we made another reproduction, and we have since made another reproduction of about another 500. From our experience -- and this is off the record --

(Remarks not reported.)

As I mentioned, the standards which we are proposing now deal only with fallout and smoke, and particulate matter in the air. We have not gotten into any other chemicals, or any other substances as yet, because we don't feel that we know enough about them in our state as yet.

Our policy with regard to local programs is briefly this: That whenever a complaint is received, whether it be individually or by a petition, that complaint is promptly referred to the city council in the city from which the complaint originates. In making that referral we point out that it has been the policy of the air pollution authority to preserve local autonomy, that we will expect them to make the investigation if they have the facilities to do so, and to satisfy the complaint in any appropriate manner that they wish. If they do not have the facilities to investigate the

complaint properly we offer the services of the staff of the Air Pollution Authority, and will make field investigations, and if the city council requests that the Authority take appropriate action to correct any conditions of air pollution that may be found to exist as a result of the investigation, the Authority will carry out that function also.

We are not too concerned about the problem of interefering with the work of consultants on area or field investigations. They were not too concerned about that problem. They have a very definitive field in handling studies of stack measurements for particulate matter or for chemicals of one sort or another, and our authority does not do that sort of work. If an industrial plant is found to be the source of pollutants in air, from our field investigation, and the Authority feels that the measurement of the emissions from that plant, whether it be a cement manufacturing plant or a steam power plant, or some other type of industrial plant, if the Authority feels that an investigation of the emissions from that plant are necessary, the Authority will order that plant to employ its own consultant and gather that data and furnish the Authority a copy of its report.

We have had a lot of interesting experiences in this operation, and I suspect that over the period of years we will have a lot more before we are through. One that I mentioned at

the seminar last year, last September, involves a small community in the state in which one area was receiving a fallout from a steam power plant of some 1700 to 1900 tons per square mile per month, and that included cinders and soot and fly ash. In this particular residential area that material was so thick on sidewalks and on grass, and people's front lawns, that the folk in that area actually had to remove their shoes before they walked in the house, or otherwise they would track up their new carpets with soot, cinders, materials of that sort. As a matter of fact it even got into a public health problem, because these cinders plugged up a roof gutter on one gentleman's house, he went up there to clean out the roof gutter, lost his balance, fell off and broke his arm. So his wife was quite certain that that was a public health problem.

In some areas where cesspools are used for the disposal of sewage or leaching wells for roof drains, those facilities have actually been completely plugged by cinders and fly ash which have been deposited in the roof gutters and find their way into these facilities during a rain.

So you run into all sorts of things.

We are having, as I say, a lot of good experiences, a lot of fun with the program. We still have a whale of a lot to learn, not only about methods but about equipment and about a lot of other things.

Thank you.

(Applause.)

MR. STERLING: As I said, I would like to have Arthur Stern talk to you and explain a little bit about the sampling program that's going on here being carried on by the Public Health Service, particularly through this station.

MR. STERN: Clarence asked me particularly to discuss the National Air Sampling Network with you, because those states which have not been in it as yet will shortly, we hope, be in it, because just about a month and a half ago we took a hard look at the way the network was developing in a more or less random and haphazard fashion, and decided that since it was the sort of thing that we wanted to put onto an organized and permanent basis we would see how we would like a network to look in order to give us information about trends of air pollution throughout the nation, the relationships between urban and non-urban areas, about peak concentrations of air pollution, the kind of information about the quality of the air which will be of value to epidemiologists in trying to determine the impact of air pollution upon the health of the nation, and to give us some guidance as to the areas in which increased activity is necessary.

So what we did at the time was to determine first the maximum potential availability of analytical facilities in our

laboratory, and said that if we had to have some basis for setting a ceiling on the network it would have to be the maximum ability of our laboratory to do the analytical work necessary.

Working backwards from that, and determining where people lived in the United States, in order to determine the population centers, determining the various kinds of controls that were necessary to determine background levels on the seacoast,mountain areas, farm lands, forests, and so forth, we came up with a list of communities that would be sampled, one sample each two weeks, in the following categories: Those which would be sampled annually; those which would be sampled bi-annually; and those which would be sampled tri-annually. This information we put together, prepared some maps showing the layout of sampling stations, both urban and non-urban, annual, bi-annual and tri-annual, throughout the country, and distributed that to the assistant regional engineers when they were here on March of this year.

We marked this little document "Administrative Confidential" at the time, because the one thing that we did not want to do was to embarrass any state or any local community by premature newspaper or magazine publicity that a certain city or certain cities in states would be sampling in the network, before the arrangements had been completed with, first, the state agency responsible, and within the state within the local

community.

We have worked out with the assistant regional engineers a mechanism for discussing with each of the states the problem of selecting locations for these samples, and working out the arrangements for getting sampling sites set up, but up to this time have not turned any of this detailed documentation over to you.

In our discussions yesterday with the Regional Engineers we have taken the next step forward, and you are going to hear, before too long, in each state, from the region, the detailed breakdown of communities in the states which we would like to see incorporated in the network, and this information will all be made available to you, and the decisions will be made locally as to whether or not you want to proceed within your own state by first making any public announcement as to what you propose to do, or whether you will proceed, as we expect you will, by first making the arrangements quietly with the local communities, and when the whole program is set up to everybody's satisfaction and gotten under way then let it be known that this is the network arrangement in your own local area.

That's essentially the story. I think that's essentially the story Mr. Sterling wanted me to tell you. The only other things I think I would like to mention are that in

this responsibility that Congress has given to us to assemble and disseminate information, we do have considerable difficulty in that our ability to use the questionnaire approach is sharply restricted by the Bureau of the Budget, therefore many things that we would like to do by way of assembling information that normally would allow us to use the questionnaire approach is not open to us.

We therefore have to follow a rather circuitous channel of reaching the cities for information through the regions, through the states, and then getting the information back so that we can assemble it, and then in turn disseminate that information to you.

So please bear with us as you get these repeated requests to get information from the cities in your states as to who is doing work in air pollution, what research is going on in your area, how much monies are being spent, what the problems are, what equipment is needed, all this kind of thing that we are trying to get information on, assemble and then turn back to you so that you can evaluate your local problems against a national framework.

(Applause.)

CHAIRMAN THATCHER: Thank you very much, Mr. Sterling, Mr. Everts, and Mr. Stern, for that excellent report bringing us up to date on air pollution activities.

I believe we have had some additional state sanitary engineers come in since we last brought the roll up to date.

(Late arrivals announced.)

Now, we have practically run out of time. It is too late to go into any committee meetings before lunchtime. It occurs to me that we may have just a few minutes for questions if any of you have something you want to bring up on these two subjects treated earlier this morning.

MR. BROWN: I wanted to ask a question whether there is any provision on the program -- I have failed to note it -- for discussion of the last matter touched upon by Harry Hanson in his excellent report; that is the inducing of people into the sanitary engineering field and recruiting for the Public Health Department. Is there a provision for that?

CHAIRMAN THATCHER: That will be handled.

SECRETARY FLETCHER: By Dwight Metzler. That is on page 2 of the agenda.

MR. METZLER: There's ten minutes only devoted to that, and all I hope to do is report on the activity of this subcommittee of the National Research Council which is making a study of the matter, and to try to get support from the State Sanitary Engineers to provide some needed basic data. I will not be prepared to lead a discussion as to what should

be done about it.

MR. BROWN: Might I discourse on that for just a minute or two? This is something that I am almost embarrassed to start harping on again, but it is something that gets me so deep that I just can't keep quiet. For quite a number of years I have been talking with various people, anytime anyone will listen to me, "What are we going to do about this business of inducing people to come into the field and to work for us in the state and local health departments?" And I have talked to state people, I have talked to local people, and I have talked to people in the Public Health Service, and nobody knows. And in the end the conversation always winds up with the question, "Why doesn't the Conference of State Sanitary Engineers do something about this?" And that's exactly the question that I would like to lay before the Conference.

It seems high time, to me, and I don't want to wax eloquent, or indignant, or anything like that, but merely point up the question that we who have such a drastic need for engineers, and who are, I think, in more than the middle stages of pernicious anemia and dying of it with regard to inability to get these people and hold on to them, ought to be pooling our thoughts and our needs and our efforts to get something started.

I have quite a number of thoughts on the subject,

which I don't want to bore the Conference with at this point, but if the Conference would in some wise entertain the idea of getting something going on this, on a shared basis of any variety that can be thought of, I would certainly like to see it.

CHAIRMAN THATCHER: Thank's Bob. I am sure that you speak the sentiments of everyone, and the best I can suggest is that maybe you will be given a little time to express more of your thoughts at the time this is handled on the program. I notice we will have two presentations touching on it, Mr. Jensen speaking for the Recruitment and Training Subcommittee, and Dwight Metzler on the manpower needs. I gather from what Dwight says that at least we will have a pooling of ignorance on this, if nothing else. It touches us all, I can assure you of that. I have got just as serious a problem as any of the rest of you.

Now, I think it is time to close this morning's session. Let me remind you again that this afternoon is reserved for committee meetings and the tour. Those who are going on the tour will meet in this room at 1:30. The Board has asked specifically that the committees write their reports. The stenographic services have been kindly provided by Harry and his staff here. We would like to have written reports wherever possible, so that we can facilitate the suggestions

and action.

So we will adjourn this session and meet tomorrow morning at 9:00 o'clock.

(Thereupon, at 12:25 o'clock p.m., the session was adjourned.)